APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/858,354	05/15/2001	Daniel H. McCabe	PA1786US	1789

22830   7590   04/09/2003

CARR & FERRELL LLP
2225 EAST BAYSHORE ROAD
SUITE 200
PALO ALTO, CA   94303

EXAMINER
WANG, JIN CHENG

ART UNIT	PAPER NUMBER
2672	6

DATE MAILED: 04/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 07-01)

	Application No.	Applicant(s)
Office Action Summary	09/858,354	MCCABE, DANIEL H.
	Examiner	Art Unit	
	Jin-Cheng Wang	2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

    A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____ .

2a) ☐ This action is **FINAL.**   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-26</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

    If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

    a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☒ Other: *IDS - Paper No. 5* .

DETAILED ACTION

Notice of Change in Art Unit

1.   The Group and/or Art Unit location of your application in the USPTO has changed. To

aid in correlating any papers for this application, all further correspondence regarding this

application should be directed to Group Art Unit 2672.

Claim Rejections - 35 USC § 102

2.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed
> in the United States before the invention by the applicant for patent or (2) a patent granted on an application for
> patent by another filed in the United States before the invention by the applicant for patent, except that an
> international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this
> subsection of an application filed in the United States only if the international application designated the United
> States and was published under Article 21(2) of such treaty in the English language.

3.   Claims 1-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Larson U.S. Pat.

No. 6,359,623.

4.   Claim 1:

U.S. Pat. No. 6,359,623 to Larson teaches a system for identifying pixels inside a

graphics primitive of a raster image (figures 1-2) comprising:

A memory for storing a raster image (column 5, lines 58-67, column 6, lines 1-4);

A graphics engine (figures 2 and 3, column 5, lines 40-57) coupled to the memory

(column 6, lines 33-43) and including a pipeline structure (column 3, lines 38-67, column 4, lines

1-18, column 6, lines 8-27), the pipeline structure receiving information related to polygonal

portions of the raster image from the memory (column 6, lines 8-54) and information related to

graphics primitives from a source for determining whether a polygonal portion of the raster image

is at least partly inside the graphics primitive (column 3, lines 5-67, column 4, lines 1-30).

5.   Claim 2:

The claim 2 encompasses the same scope of invention as that of claim 1 except additional

claimed limitation of a predetermined number of sequential logic circuits and a predetermined

number of parallel logic circuits. However, Larson further discloses the claimed limitation of a

predetermined number of sequential logic circuits and a predetermined number of parallel logic

circuits (column 3, lines 17-37).

Claim 3:

The claim 3 encompasses the same scope of invention as that of claim 1 except additional

claimed limitation of the pipeline structure dividing the polygonal portion into a predetermined

number of polygonal sub-portions if the polygonal portion is at least partly inside the graphics

primitive. However, Larson further discloses the claimed limitation of the pipeline structure

dividing the polygonal portion into a predetermined number of polygonal sub-portions if the

polygonal portion is at least partly inside the graphics primitive (figure 4, column 11, lines 1-15)

Claim 4:

The claim 4 encompasses the same scope of invention as that of claim 12 except

additional claimed limitation of the pipeline structure determining whether the polygonal portion

of the raster image is at least partly inside the graphics primitive by evaluation of edge function of

the graphics primitive. However, Larson further discloses the claimed limitation of the pipeline

structure determining whether the polygonal portion of the raster image is at least partly inside the

graphics primitive by evaluation of edge function of the graphics primitive (column 12, lines 16-
67, column 13, lines 1-51).

Claim 5:

The claim 5 encompasses the same scope of invention as that of claim 4 except additional
claimed limitation of each edge function of the graphics primitive being based on a general edge
function, $e(x,y) = e0 + Nx\, X + Ny\, Y$. However, Larson further discloses the claimed limitation of
each edge function of the graphics primitive being based on a general edge function, $e(x,y) = e0 +
Nx\, X + Ny\, Y$ (column 12, lines 16-67, column 13, lines 1-51).

Claim 6:

The claim 6 encompasses the same scope of invention as that of claim 4 except additional
claimed limitation of the edge function being evaluated at a corner vertex of the polygonal
portion, the corner vertex being farthest in a positive direction from a primitive edge associated
with the edge function. However, Larson further discloses the claimed limitation of the edge
function being evaluated at a corner vertex of the polygonal portion, the corner vertex being
farthest in a positive direction from a primitive edge associated with the edge function (column
12, lines 16-67, column 13, lines 1-51).

Claim 7:

The claim 7 encompasses the same scope of invention as that of claim 2 except additional
claimed limitation of the pipeline structure being configured such that the sequential logic circuits
are coupled together in series followed by the parallel logic circuits coupled together in parallel.
However, Larson further discloses the claimed limitation of the pipeline structure being

configured such that the sequential logic circuits are coupled together in series followed by the

parallel logic circuits coupled together in parallel (e.g., column 5, lines 23-67, column 6, lines 1-4,

column 9, lines 4-8).

Claim 8:

The claim 8 encompasses the same scope of invention as that of claim 2 except additional

claimed limitation of the pipeline structure comprising seven sequential logic circuits connect in

series and seven parallel logic circuits coupled together in a multi-stage pyramid structure.

However, Holtz further discloses the claimed limitation of the pipeline structure comprising seven

sequential logic circuits connect in series and seven parallel logic circuits coupled together in a

multi-stage pyramid structure (e.g., column 5, lines 23-67, column 6, lines 1-4, column 9, lines 4-

8).

Claim 9:

The claim 9 encompasses the same scope of invention as that of claim 3 except additional

claimed limitation of the pipeline structure determining the two polygonal sub-portions by

determining midpoint values of two opposite sides of the polygonal portion of the raster image

and using the midpoint values as vertices of the two polygonal sub-portions. However, Larson

further discloses the claimed limitation of the pipeline structure determining the two polygonal

sub-portions by determining midpoint values of two opposite sides of the polygonal portion of the

raster image and using the midpoint values as vertices of the two polygonal sub-portions (figure 4,

column 12, lines 16-67, column 13, lines 1-51).

Claim 10:

The claim 10 encompasses the same scope of invention as that of claim 1 except

additional claimed limitation of the pipeline structure further comprising a predetermined number

of pixel engines for determining attribute values associated with each pixel. However, Larson

further discloses the claimed limitation of the pipeline structure further comprising a

predetermined number of pixel engines for determining attribute values associated with each pixel

(column6, lines 28-54).

Claim 11:

The claim 11 encompasses the same scope of invention as that of claim 1 except

additional claimed limitation of the polygonal portion of a raster image having a width and a

height, each of the width and the height having a value of a power of 2^m. However, Larson

further discloses the claimed limitation of the polygonal portion of a raster image having a width

and a height, each of the width and the height having a value of a power of 2^m (figure 4, column

11, lines 1-67, column 12, lines 1-3).

6.   Claim 12:

U.S. Pat. No. 6,359,623 to Larson teaches a method for identifying pixels inside a

graphics primitive of a raster image (see the abstract, figures 6-10) comprising the steps of:

(a) Determining whether a polygonal portion of the raster image is at least partly inside

the graphics primitive (column 3, lines 5-67, column 4, lines 1-17);

(b) Dividing the polygonal portion of the raster image into a predetermined number of

polygonal subportions if the polygonal portion of the raster image is at least partly inside the

graphics primitive (column 11, lines 1-16);

(c) Determining whether each polygonal sub-portion of the raster image is at least partly

inside the graphic primitive (column 11, lines 1-16);

(d) Further dividing the polygonal sub-portion into a predetermined number of polygonal

sub-portions if the polygonal sub-portion is at least partly inside the graphics primitive and is

larger than a pixel (figure 4, column 11, lines 1-16).

Claim 13:

The claim 13 encompasses the same scope of invention as that of claim 12 except

additional claimed limitation of recursively performing (c) and (d) until no more polygonal sub-

portions that are at least partly inside the graphics primitive. However, Larson further discloses

the claimed limitation of recursively performing (c) and (d) until no more polygonal sub-portions

that are at least partly inside the graphics primitive (figure 4, column 11, lines 1-16).

Claim 14:

The claim 14 encompasses the same scope of invention as that of claim 12 except

additional claimed limitation that determining step (a) further comprises the step of receiving a

plurality of values for corner vertices of the polygonal portion and arithmetic edge functions

related to the graphic primitive having a coordinate reference frame located at a geometric center

of the polygonal portion, the arithmetic edge function corresponding to an edge of the graphics

primitive. However, Larson further discloses the claimed limitation of that determining step (a)

further comprises the step of receiving a plurality of values for corner vertices of the polygonal

portion and arithmetic edge functions related to the graphic primitive having a coordinate

reference frame located at a geometric center of the polygonal portion, the arithmetic edge

function corresponding to an edge of the graphics primitive (figure 4, column 11, lines 1-67, column 12, lines 1-67, column 13, lines 1-51).

Claim 15:

The claim 15 encompasses the same scope of invention as that of claim 14 except additional claimed limitation that the determining step (a) further comprises the step of evaluating an arithmetic edge function received at a corner vertex of the polygonal portion, the corner vertex being farthest in a positive direction relative to the corresponding edge of the graphics primitive.

However, Larson further discloses the claimed limitation of that the determining step (a) further comprises the step of evaluating an arithmetic edge function received at a corner vertex of the polygonal portion, the corner vertex being farthest in a positive direction relative to the corresponding edge of the graphics primitive (figure 4, column 11, lines 1-67, column 12, lines 1-67, column 13, lines 1-51).

Claim 16:

The claim 16 encompasses the same scope of invention as that of claim 15 except additional claimed limitation of the polygonal portion being at least partly inside the graphics primitive if all arithmetic edge functions evaluated being positive. However, Larson further discloses the claimed limitation of the polygonal portion being at least partly inside the graphics primitive if all arithmetic edge functions evaluated being positive (figure 4, column 11, lines 1-67, column 12, lines 1-67, column 13, lines 1-51).

Claim 17:

The claim 17 encompasses the same scope of invention as that of claim 12 except additional claimed limitation that the dividing step (b) further comprises the step of dividing the polygonal portion into two polygonal sub-portions by determining midpoint values of two opposite sides of the polygonal portion. However, Larson further discloses the claimed limitation that the dividing step (b) further comprises the step of dividing the polygonal portion into two polygonal sub-portions by determining midpoint values of two opposite sides of the polygonal portion (figure 4, column 11, lines 1-67, column 12, lines 1-67, column 13, lines 1-51).

Claim 18:

The claim 18 encompasses the same scope of invention as that of claim 12 except additional claimed limitation that the dividing step (b) further comprises the step of sequentially deriving two new sets of arithmetic edge functions associated with a translated coordinate reference frame located at a geometric center of a corresponding one of the polygonal sub-portions. However, Larson further discloses the claimed limitation that the dividing step (b) further comprises the step of sequentially deriving two new sets of arithmetic edge functions associated with a translated coordinate reference frame located at a geometric center of a corresponding one of the polygonal sub-portions (figure 4, column 11, lines 1-67, column 12, lines 1-67, column 13, lines 1-51).

Claim 20:

The claim 20 encompasses the same scope of invention as that of claim 12 except additional claimed limitation of an electronic readable medium having embodied thereon a program. However, Larson further discloses the claimed limitation of an electronic readable

medium having embodied thereon a program (e.g., figure 9, column 9, lines 62-67, column 10, lines 1-6, column 17, lines 1-9).

Claim 21:

The claim 21 encompasses the same scope of invention as that of claim 20 except additional claimed limitation of recursively performing (c) and (d) until no more polygonal sub-portions that are at least partly inside the graphics primitive. However, Larson further discloses the claimed limitation of recursively performing (c) and (d) until no more polygonal sub-portions that are at least partly inside the graphics primitive (figure 4, column 11, lines 1-16).

7.   Claim 22:

U.S. Pat. No. 6,359,623 to Larson teaches a method of identifying pixels inside a graphics primitive of a raster image (see the abstract, figures 6-10) comprising the steps of:

(a) Selecting a tile including a pixel (column 10, lines 42-54);

(b) Determining if a portion of the tile is within the graphics primitive (column 10, lines 55-67, column 11, lines 1-16);

(c) Dividing the tile into sub-tiles if a portion of the tile is within the graphics primitive (column 11, lines 1-16);

(d) Recursively dividing each sub-tile having a portion within the graphics primitive until the sub-tile is equal in size to a pixel (figure 4, column 11, lines 1-16).

Claim 23:

The claim 23 encompasses the same scope of invention as that of claim 22 except additional claimed limitation of the step of disregarding the tile or sub-tile from subsequent decomposition if the tile or sub-tile being outside of the graphics primitive. However, Larson further discloses the claimed limitation of the step of disregarding the tile or sub-tile from subsequent decomposition if the tile or sub-tile being outside of the graphics primitive (column 10, lines 55-67).

Claim 24:

The claim 24 encompasses the same scope of invention as that of claim 22 except additional claimed limitation that the step of determining further comprises evaluating the tile at a corner vertex which is farthest in a positive direction relative to a current edge of the graphics primitive. However, Larson further discloses the claimed limitation that the step of determining further comprises evaluating the tile at a corner vertex which is farthest in a positive direction relative to a current edge of the graphics primitive (column 10, lines 55-67).

Claim 25:

The claim 25 encompasses the same scope of invention as that of claim 22 except additional claimed limitation that the step of recursively dividing further comprises determining if the sub-tile is at least partly within the graphics primitive by evaluating the sub-tile at a corner vertex which is farthest in a positive direction relative to a current edge of the graphics primitive. However, Larson further discloses the claimed limitation that the step of recursively dividing further comprises determining if the sub-tile is at least partly within the graphics primitive by evaluating the sub-tile at a corner vertex which is farthest in a positive direction relative to a current edge of the graphics primitive (column 10, lines 55-67).

Claim 26:

The claim 26 encompasses the same scope of invention as that of claim 22 except additional claimed limitation of an electronic readable medium having embodied thereon a program. However, Larson further discloses the claimed limitation of an electronic readable medium having embodied thereon a program (e.g., figure 9, column 9, lines 62-67, column 10, lines 1-6, column 17, lines 1-9).

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

M. D. McCool et al. "Incremental and Hierarchical Hilbert Order Edge Equation Polygon Rasterization" discloses a rasterization algorithm to efficiently generate pixel fragments from geometric descriptions of primitive.

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jin-Cheng Wang whose telephone number is (703) 605-1213. The examiner can normally be reached on 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Razavi can be reached on (703) 305-4713. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-6606 for regular communications and (703) 308-6606 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding

should be directed to the receptionist whose telephone number is (703) 395-3900.

jcw
March 31, 2003

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600

IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Daniel H. McCabe

SERIAL NO.: 09/858,354

FILED: May 15, 2001

TITLE: Parallel Architecture for Graphics Primitive Decomposition

EXAMINER: Unknown

GROUP ART UNIT: 2671

ATTY.DKT.NO.: PA1786US

COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

List of Co-Pending Patent Applications That May Be Directed
Towards Similar Subject Matter

Examiner's Initials	Serial Number	First-Named Inventor	Title	Filing Date
(initials)	09/858,306	Daniel H. McCabe	Graphics Primitive Decomposition Using Edge Functions and Recursive Tile Subdivision	05-15-01
Examiner's Signature:	*(signature)* Wang			Date